

**Slant/Fin**<sup>®</sup>

# Victory<sup>™</sup>

## HOT WATER MODELS V-33 THROUGH V-180

GAS-FIRED CAST-IRON BOILERS FOR NATURAL AND L.P. PROPANE GASES

### INSTALLATION AND OPERATING INSTRUCTIONS

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#### **IMPORTANT**

#### **READ ALL OF THE FOLLOWING WARNINGS AND STATEMENTS BEFORE READING THE INSTALLATION INSTRUCTIONS**

##### **WARNING**

##### **LIQUEFIED PETROLEUM (L.P.) PROPANE FIRED GAS BOILERS**

Installation location ONLY as permitted in paragraph entitled "LIQUEFIED PETROLEUM (L.P.) PROPANE GAS FIRED BOILER LOCATION" on page 3 of this instruction book.

The above warning does not apply to **NATURAL** gas fired boilers.

The installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the National Fuel Gas Code, ANSI Z223.1-latest edition. The installation must also conform to the additional requirements in this Slant/Fin Instruction Book.

In addition where required by the authority having jurisdiction, the installation must conform to American Society of Mechanical Engineers Safety Code for Controls and Safety Devices for Automatically Fired Boilers. No. CSD-1.

This manual must be left with owner and should be hung on or adjacent to the boiler for reference.

##### **WARNING**

This boiler, gas piping and accessories must be installed, connected, serviced and repaired by a trained, experienced service technician, familiar with all precautions required for gas fired equipment and licensed or otherwise qualified, in compliance with the authority having jurisdiction.



IEWS—DIMENSIONS—DATA

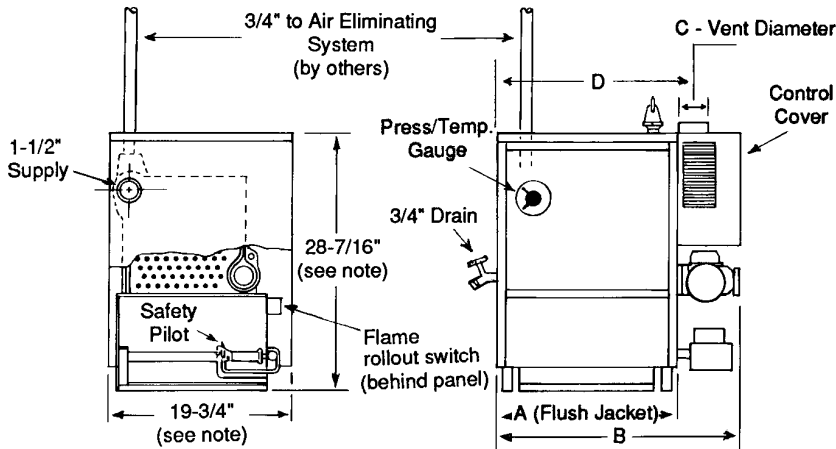


Figure 1. Left End View

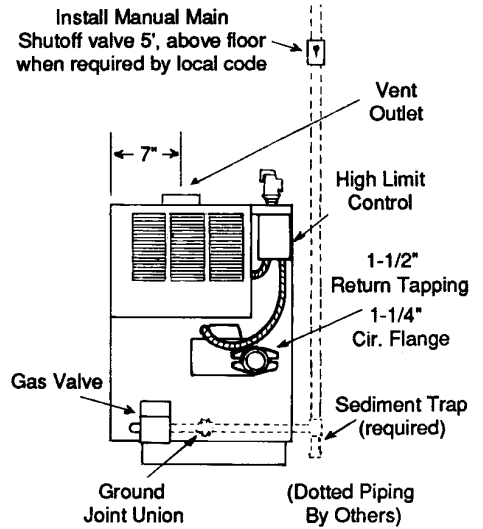


Figure 2. Front View

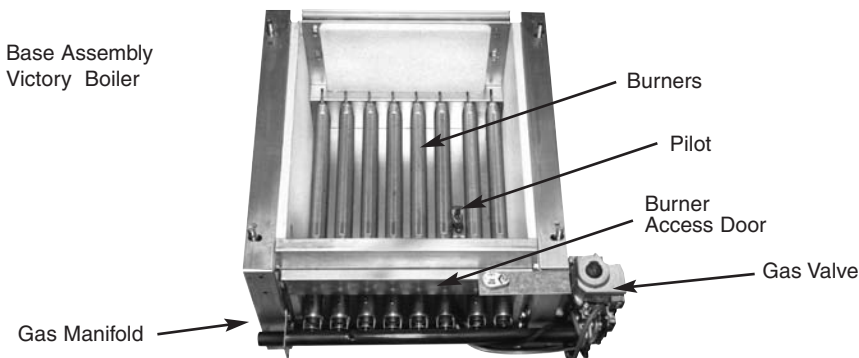
Figure 3. Right End View

NOTE: Height Dimension increases to 30-3/16" and depth dimension increases to 22-1/4" when combustible floor kit is used.

Boiler Model	No. of Sections	Dimensions (inches)					Approx. Total Wt. Full Of Water (lb.)	Size of Gas Line Connection to Boiler (inches)	
		A	B	C = Vent Dia.		D		Natural	Propane
				Pressure Horizontal or Vertical Venting	Natural draft chimney or type "B" venting				
V-33	2	8 1/8"	14 5/8"	3"	—	9 1/2"	1/2"	1/2"	
V-60	3	11 1/8"	17 5/8"	3"	—	12 1/2"	1/2"	1/2"	
V-90	4	14 1/8"	20 5/8"	3"	5"	14 1/2"	1/2"	1/2"	
V-120	5	17 1/8"	23 5/8"	3"	5"	17 1/2"	1/2"	1/2"	
V-150	6	20 1/8"	26 5/8"	3"	5"	20 1/2"	1/2"	1/2"	
V-180	7	23 1/8"	29 5/8"	3"	5"	23 1/2"	1/2"	1/2"	

Boiler Model	Gas Type	Orifice Size for Sea Level	Orifice Sizes for High Altitudes Includes 4% Reduction for Each 1000 Feet								
			Elevation — Feet								
			2000	3000	4000	5000	6000	7000	8000	9000	10000
V-33	Natural	#48	49	50	50	50	51	51	52	52	52
V-33	Propane	#56	56	56	57	57	57	58	59	59	60
V-60 thru V-180	Natural	#50	51	51	51	52	52	52	52	53	53
V-60 thru V-180	Propane	#57	58	59	59	60	60	61	62	63	63

Orifice sizes indicated for sea level above are factory installed in boiler unless otherwise specified by the local authority. Orifice table is based on a higher heating value between 1000 Btuh and 1009 Btuh for Natural Gas (see III, page 13, if local higher heating value exceeds these numbers). See III, page 13, for burner input adjustment.



**INSTALLATION REQUIREMENTS**

The installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the National Fuel Gas Code, ANSI Z223.1-latest edition.  
This installation must also conform to the additional requirements in this Slant/Fin instruction book.

**NATURAL GAS FIRED BOILER LOCATION**

Provide a level, solid foundation for the boiler. Location should be as near as possible to chimney or outside wall so that the flue pipe from boiler is short and direct. (See Appendix B for vent terminal location restrictions.)  
The location should also be such that the gas ignition system components are protected from water (dripping, spraying, rain, etc.) during appliance operation and service (circulator replacement, condensate trap, control replacement, etc.).

**WARNING**

**LIQUEFIED PETROLEUM (L.P.) PROPANE FIRED GAS BOILER LOCATION**  
REQUIRES SPECIAL ATTENTION

Liquefied Petroleum (L.P.) propane gas is *heavier than air*. Therefore, propane boilers, piping, valves must NOT be installed in locations where propane leaking from defective equipment and piping will "pool" in a basement or other space below the leak.

A spark or flame from the boiler or other source may ignite the accumulated propane gas causing an explosion or fire. Provide a level, solid foundation for the boiler. Location should be as near the chimney as possible so that the flue pipe from boiler to chimney is short and direct.  
**The UNIFORM MECHANICAL CODE may be in effect in your geographic area.**

The following precautions are cited by the 1994 UNIFORM MECHANICAL CODE, section 304.6:  
**"LPG Appliances.** Liquefied petroleum gas-burning appliances shall not be installed in a pit, basement or similar location where heavier-than-air-gas might collect. Appliances so fueled shall not be installed in an above-grade under-floor space or basement unless such location is provided with an approved means for removal of unburned gas."  
 Consult Chapter 5 of the 1994 UNIFORM MECHANICAL CODE for design criteria of the "approved" means for removal of unburned gas.

**BOILER FOUNDATION**

- A. Provide a solid, level foundation, capable of supporting the weight of the boiler filled with water, and extending at least 2" past the jacket on all sides. See dimensions of boilers, page 2.
- B. For installation on non-combustible floors only\*.
- C. If boiler is to be located over buried conduit containing electric wires or telephone cables, consult local codes or the National Board of Fire Underwriters for specific requirements.

\* Installation on combustible flooring allowed only with proper Combustible Floor Kit. Kit part number is printed on boiler rating plate. In no case may the boiler be installed on carpeting.

**MINIMUM CLEARANCES FROM COMBUSTIBLE CONSTRUCTIONS**

A. Minimum boiler clearances shall be as follows:

**VICTORY BOILER**

MINIMUM CLEARANCE FOR COMBUSTIBLE CONSTRUCTION.  
MINIMUM ALCOVE AND CLOSET CLEARANCE.

Front	6"
Rear	6"
Left Side	6"
Right Side	12"
Top (above boiler)	12"
Flue Connector	6"

- B. Provide accessibility clearance of 24" on sides requiring servicing and 18" on sides used for passage.
- C. All minimum clearances shown above must be met. This may result in increased values of some minimum clearances in order to maintain the minimum clearances of others.
- D. Clearance from hot water pipes shall be 1 inch\*\*.  
 \*\* At points where hot water pipes emerge from a floor, wall or ceiling, the clearance at the opening through the finished floor boards or wall or ceiling boards may be not less than 1/2 inch. Each such opening shall be covered with a plate of uncombustible material.

**SAFETY**

KEEP THE BOILER AREA CLEAR AND FREE FROM COMBUSTIBLE MATERIALS, GASOLINE AND OTHER FLAMMABLE VAPORS AND LIQUIDS.

**FLUE GAS VENTING REQUIREMENTS**

The Victory series boiler is a high efficiency, mechanically induced draft boiler and, therefore, requires different venting arrangements than natural draft, lower efficiency boilers.

**THE FOLLOWING INSTRUCTIONS MUST BE CAREFULLY READ AND FOLLOWED IN ORDER TO AVOID ANY HAZARDOUS CONDITIONS DUE TO IMPROPER INSTALLATION OF THE FLUE GAS VENTING SYSTEM.**

The vent piping installation **MUST** be in accordance with these instructions and with ANSI Z223.1-latest edition NATIONAL FUEL GAS CODE, Part 7, Venting of Equipment. Other local codes may also apply and must be followed. Where there is a conflict between these requirements, the more stringent case shall apply.

If this boiler is replacing a boiler which is connected to a common venting system with other natural draft, gas fired appliances, the removal of the existing boiler from the venting system is likely to cause the system to be too large for proper venting of the appliances remaining connected to it. At the time of removal of the existing boiler, the test procedure specified in Appendix "A" must be followed.

Figure 5 shows the models, vent sizes, conditions and requirements for different types of venting.

The use of a vent damper is NOT permitted on this boiler series.

**NATURAL DRAFT CHIMNEY AND TYPE "B" VENTING**

VICTORY boilers are power (fan assisted) vented boilers. All Victory boiler models can be PRESSURE side wall or vertically vented by connecting the proper 3" diameter vent to the 3" diameter collar and adapter factory equipped on the Victory boilers. See "HORIZONTAL PRESSURE VENTING" and "VERTICAL PRESSURE VENTING".

Models V-33 and V-60 can ONLY be pressure vented as described above and must NOT be vented into a chimney or "B" vent.

Models V-90, V-120, V-150 and V-180 may be vented into a natural draft chimney or natural draft "B" vent if the factory equipped 3" diameter flue collar and adapter on the boiler is REMOVED and REPLACED by the 5" diameter flue collar manufactured by Slant/Fin Corporation and included in the V-90 through V-180 shipping crates. (See figures 6a and 6b.)

**If the boiler vent is to be installed into a natural draft masonry chimney or Type "B" venting, it must be in accordance with National Fuel Gas Code ANSI Z223.1- latest edition, Part 7, Part 11 and Appendix G.**

**For a masonry vitreous tile-lined chimney which is not exposed to the outdoors, use Table 1 in this Slant/Fin manual for venting requirements. DO NOT install this system into an unlined masonry chimney.**

**If a masonry chimney is exposed to the outdoors on one or more sides below the roof line (exposed chimney), it must be re-lined with a UL LISTED metallic liner system. See Table 2 in this Slant/Fin manual for venting requirements of metallic re-lined chimneys.**

**If a Type "B" vent system is used, it must NOT be exposed to the outdoors below the roof line. See Table 2 in this Slant/Fin manual for venting requirements.** Vent connectors serving appliances vented by natural draft shall NOT be connected into any portion of mechanical draft systems operating under positive pressure. Single or multiple appliance venting is shown in Figures 6a and 6b.

All Victory boilers require a condensate drain and drain trap. Vent connectors must be liquid tight.

<b>Table 1. Masonry Vitreous Tile-Lined Chimney (not metal lined)</b> Chimneys not exposed to the outdoors below the roof line. (5" dia. collar must be used)			
<b>Appliance</b>	<b>Connector</b>	<b>Requirements*</b>	<b>Reference Table No. * (ANSI Z223.1)</b>
Victory Boilers (V-90, V-120, V-150 and V-180) Single Appliance	Type "B"	1. Connector diameter must be upsized to 7". 2. Chimney height limits: Min. 15 ft., Max. 30 ft. 3. Lateral length restriction applies (see table 11-3) 4. Internal area of chimney: Min. 50 sq. in., Max. 269 sq. in.	11-3
Victory Boiler (V-180 only) Single Appliance	Single-wall	1. Connector diameter must be upsized to 7". 2. Chimney height limits: Min. 15 ft., Max. 30 ft. 3. Max. lateral length may not exceed 2 ft. 4. Internal area of chimney: Min. 50 sq. in., Max. 269 sq. in.	11-4
Victory Boilers (V-90, V-120, V-150 and V-180) plus another gas appliance	Type "B"	1. See table 11-8 for chimney height and connector length restrictions. 2. Connector may have to be upsized to 6" diameter to meet requirement of 11-8.	11-8
Victory Boilers (V-150 and V-180 only) plus another gas appliance	Single-wall	1. See table 11-9 for chimney height and connector length restrictions. 2. Connector may have to be upsized to 6" diameter to meet requirement of 11-9.	11-9

<b>Table 2. Type "B" Venting and Metal-Lined Masonry Chimney</b> UL LISTED MATERIALS ONLY. (5" dia. collar must be used)			
<b>Appliance</b>	<b>Connector</b>	<b>Requirements*</b>	<b>Reference Table No. * (ANSI Z223.1)</b>
Victory Boilers (V-90, V-120, V-150 and V-180) Single appliance	Type "B"	See table 11-1 for minimum and maximum of vent height and lateral length restriction.	11-1
Victory Boiler (V-90, V-120, V-150 and V-180) Single appliance	Single-wall	See table 11-2 for minimum and maximum of vent height and lateral length restriction.	11-2
Victory Boilers (V-90, V-120, V-150 and V-180) plus another gas appliance	Type "B"	1. See table 11-6 for vent height and connector length restrictions. 2. Connector and vent diameter may have to be increased to 6" or 7" to meet requirement of table 11-6.	11-6
Victory Boilers (V-120, V-150 and V-180 only) plus another gas appliance	Single-wall	1. See table 11-7 for vent height and connector length restrictions. 2. Connector and vent diameter may have to be increased to 6" to meet requirement of table 11-7.	11-7

\* Also see Z223.1 Part 7 and see Part 11 for use of mentioned tables.

**HORIZONTAL PRESSURE VENTING**

All VICTORY models are certified for horizontal pressure venting with the following restrictions:

**1. Vent Material**

- A. The vent system for horizontal venting must be UL listed single wall Saf-T 3" diameter #AL 29-4C▲ stainless steel manufactured by Heat-Fab, Inc. The manufacturers' part numbers for various items of the vent system are listed in SLANT/FIN Parts List, Publication # V-10PL.
- B. DO NOT use plastic or galvanized flue pipe.
- C. For horizontal, through the wall venting, the 3" flue collar and adapter MUST be used. The vent pipe size must be 3" diameter from the boiler to the outside termination. Certain restrictions on the location of the vent terminal are specified in APPENDIX "B" and must be followed.

**2. Installation**

- A. Figures 7 and 8 show the allowed venting arrangements. The maximum equivalent vent length is 40 feet plus vent terminal for all models except V-180 which has a 20 feet maximum equivalent vent length. Every 90° turn in the vent piping is equivalent to 5 feet of straight run, (eg. a V-120 system with 3 elbows and the outside terminal would allow 40 - 15 = 25 feet of straight run). The minimum allowable equivalent vent

length is 2 feet and 1 elbow plus vent terminal for all models, see table below. NOTE: For best operation, elbows should be at least five diameters apart otherwise maximum vent length should be reduced.

- B. When joining the various components of the above listed vent systems, the manufacturers' instructions should be closely followed to insure proper sealing. Use GE-RTV 106 or Dow Corning 732 Sealant for sealing of pipe and fittings. See figure 4 for proper application of vent pipe sealant.
- C. All Victory boilers require a condensate drain and drain trap.

The horizontal pipe must be sloped TOWARD the condensate drain at least 1/4" per 1' of run. The horizontal portion must also be supported with pipe straps at intervals no greater than indicated by vent pipe manufacturer's instruction.

Where the vent pipe goes through the outside wall, a thimble must be used (see Figures 7 and 8).

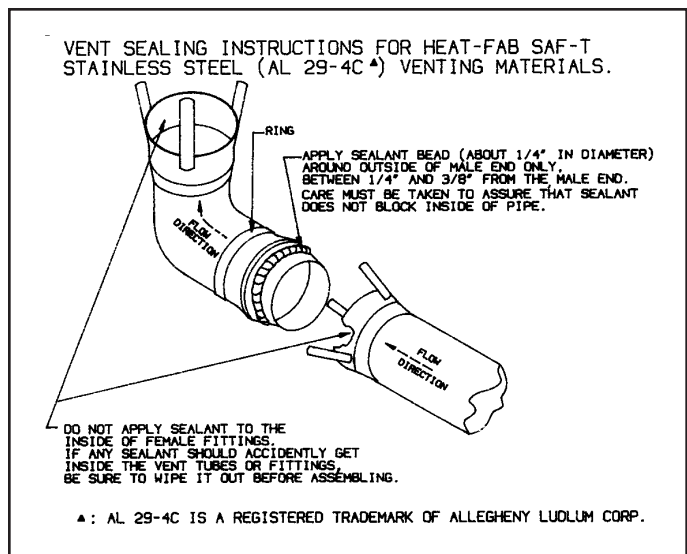
Heat-Fab pipes and fittings **cannot** be cut to length. Use slip joint connector (Heat-Fab part no. 7324GC) to adjust pipe lengths dimensions.

**3" Diameter Venting System Restrictions**

Model	Maximum Equivalent Length including Elbows*	Equivalent Length of Elbows	Minimum Length*	Minimum No. of Elbows*
V-33 to V-150	40 ft.	5 ft.	2 ft.	1
V-180	20 ft.	5 ft.	2 ft.	1

\* Vent terminal is in addition to the allowed vent pipe length and elbows.

**Figure 4. Vent Sealing Instructions**  
(Consult vent manufacturer's instructions.)



▲: AL 29-4C is a registered trademark of Allegheny Ludlum Corp.



Figure 5.

Model/Vent Size	Requirements
<b>NATURAL DRAFT CHIMNEY AND TYPE "B" VENTING</b>	
V-90, V-120, V-150 and V-180 boilers may be vented into a chimney (see "Chimney and type "B" venting" paragraph on page 4) or into a type "B" vent, ONLY when converted to the 5" dia. Slant/Fin flue collar supplied unassembled with these boilers and ONLY as described here, other places in this booklet and in figures 6a and 6b.	Standard vent connector materials (i.e. galvanized or stainless steel vent pipe). Condensate drain and liquid tight seal is required. See figures 6a, 6b and "Chimney and type "B" venting" on page 4.
<b>PRESSURE HORIZONTAL AND VERTICAL VENTING</b>	
V-33, V-60, V-90, V-120, V-150 and V-180 may be vented horizontally and vertically ONLY when boilers are equipped with the Slant/Fin factory installed 3" dia. flue collar and adapter is used ONLY as described here, other places in this booklet and figures 7, 8 and 9.	ONLY 3" dia. single wall Saf-T #AL 29-4C <sup>▲</sup> stainless steel manufactured by Heat-Fab, Inc. may be used. Condensate drain and liquid and pressure tight sealing is required. See figures 7, 8, and 9.

The condensate drain should be installed as close to the boiler as possible. The drain fitting size is 3/8" or 1/2" depending on the type of drain assembly. Clear plastic tubing (3/8" I.D. or 1/2" I.D.) sized to fit the fitting must be connected to the drain fitting. The clear tubing should be formed into approximately a 4-5 inch diameter loop to form a trap. The loop should be tied with cord or a cable tie where the loop crosses over itself. See figures 6,7,8 and 9. This loop should then be filled with water to form a liquid filled trap. DO NOT OPERATE THE BOILER WITHOUT INSTALLING THIS TRAP AND FILLING WITH WATER. Periodic inspection should be made of this assembly for deterioration of the tubing and to insure that the trap is not plugged. If it is plugged or appears to have excessive sediment in it, it should be removed from the drain assembly, straightened out to clear the obstruction, reformed, filled with water and reinstalled as before. The drain should extend to a floor drain or to a plastic container which will require emptying periodically.

**D. WHEN VENTING HORIZONTALLY, COMMON VENTING WITH OTHER APPLIANCES IS NOT ALLOWED.**

### VERTICAL PRESSURE VENTING

Vertical pressure venting (not natural draft chimney and type "B" venting) is allowed with the 3" flue collar and adapter and #AL 29-4C<sup>▲</sup> stainless steel vent system previously shown in "Horizontal Pressure Venting" paragraph No.1. This arrangement is shown in Figure 9.

Note, that when using a 3" diameter vent for vertical pressure venting, a chimney may be used as a chase for a vertical vent (support is required in conjunction with firestop as per vent manufacturers' instruction). The 3" vent system MUST extend the total length of the chimney but not longer than the equivalent length limitations indicated on page 5 under "HORIZONTAL PRESSURE VENTING" paragraph 2A. Other appliances can NOT be vented into the same chimney.

As noted previously, all Victory boilers MUST be installed with a condensate drain trap. Vent system must be sealed liquid and pressure tight.

The instructions indicated in "HORIZONTAL PRESSURE VENTING" on pages 5 and 6 must also be followed for the above described Vertical Pressure Venting except, use figure 9 including the clearances shown in figure 9 in place of figures 7 and 8.

### REGULAR INSPECTION

A. Inspect the system regularly for condensation, corrosion and/or physical damage. A qualified professional should service

the boiler annually and include such an inspection at that time. The homeowner should look over the system monthly for damage, water stains, any signs of rust, other corrosion or separation of the flue (vent) tubing and fittings.

B. Should an inspection turn up signs of condensation, corrosion or damage, the boiler should be shut down immediately and the condition should be corrected by a qualified professional.

### GAS PIPING

- A. Local installation codes apply. The pipe joint compound used on threads must be resistant to the action of liquefied petroleum gases.
- B. The gas supply line to the boiler should be run directly from the meter for natural gas or from the fuel tank for L.P. propane gas. See page 2 for location of union and manual main shut-off valve that may be specified locally.
- Selecting pipe size for natural gas:
1. Measure or estimate the length of piping from the meter to the installation site.
  2. Consult gas supplier for heating value of gas (BTU/cu. ft.).
  3. Divide boiler rated input by heating value to find gas flow in piping (cu. ft. per hour).
  4. Use table below to select proper pipe size.

Example: Boiler model V-150 is to be installed. Distance from gas meter to the boiler is 30 ft. Heating value of natural gas is 1020 BTU/cu. ft. Select proper pipe size.

$$\text{Gas flow} = \frac{150,000 \text{ BTU/hour}}{1020 \text{ BTU/cu. ft.}} = 147 \text{ cu. ft. per hour}$$

At 30 ft. length of pipe, match required capacity from table below (choose higher capacity, in this case is 152 cu. ft. per hour). Required pipe size is 3/4".

Improper gas pipe sizing will result in pilot flame outages, insufficient heat and other installation difficulties. For more information and also if other appliances are to be attached to the piping system, see Appendix C of National Fuel Gas Code ANSI Z223.1-latest edition.

C. The boiler and its gas connection must be leak tested before placing the boiler in operation. Use liquid soap solution for all gas leak testing. DO NOT use open flame. This boiler and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 PSIG.

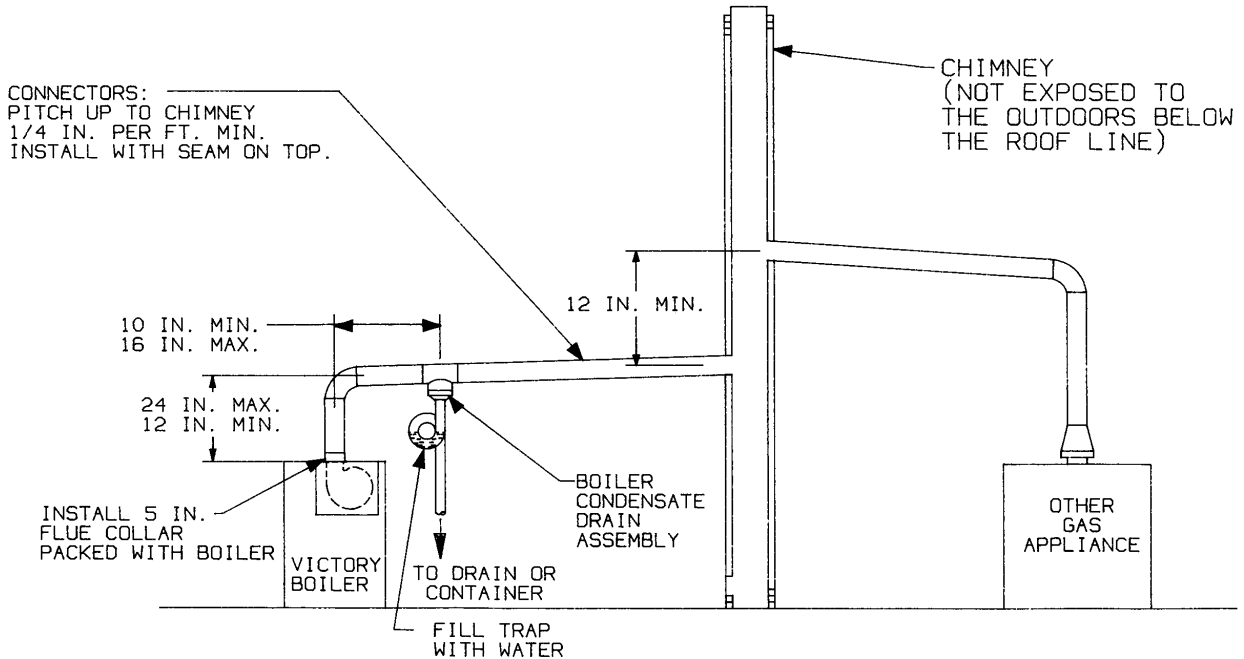
This boiler must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system

▲: AL 29-4C is a registered trademark of Allegheny Ludlum Corp.

**Figure 6a. Chimney Venting for V-90, V-120, V-150 and V-180 only.**

**Minimum vent connectors diameter is 5 inches. It may have to be upsized to 6 or 7 inches (see Table 1).** Single or multiple appliance venting into chimney using single wall or type "B" metal connectors, must be installed in accordance with National Fuel Gas Code ANSI Z223.1-latest edition, part 7 and 11. See "Chimney and Type "B" Venting" paragraph on page 4 of this manual. **DO NOT** use galvanized risers and connectors in cool boiler rooms.

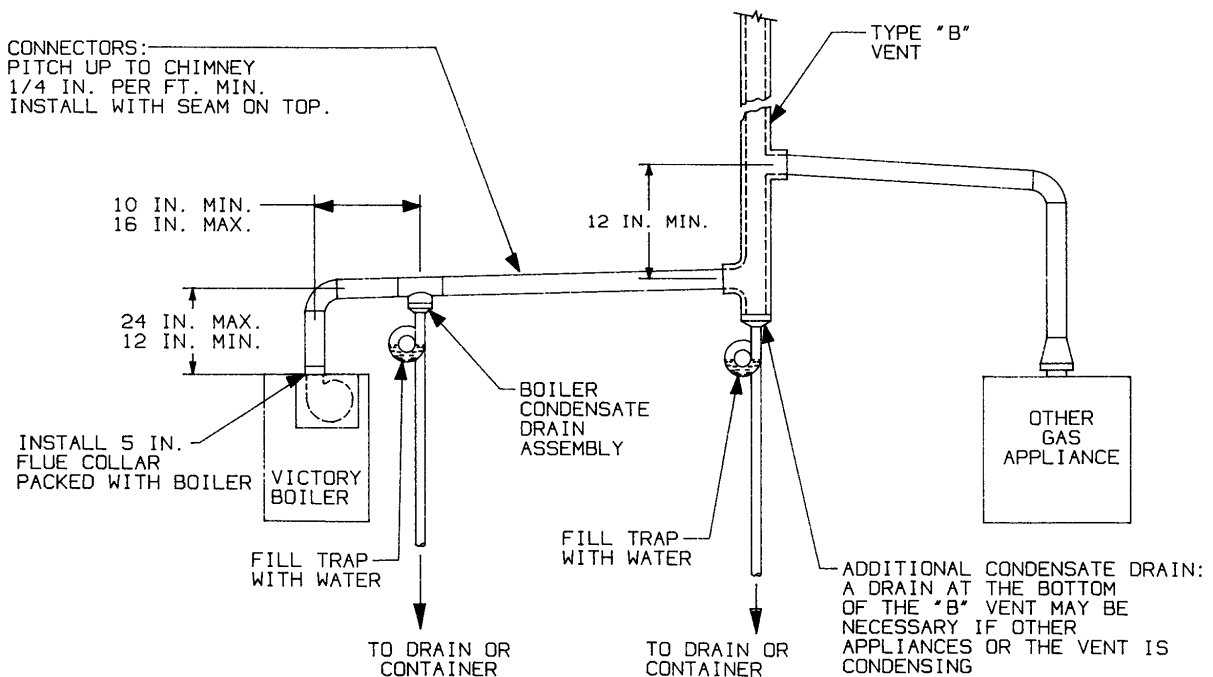
**ALL ITEMS SHOWN BELOW ARE REQUIRED.**  
**All vent connector joints must be LIQUID tight.**



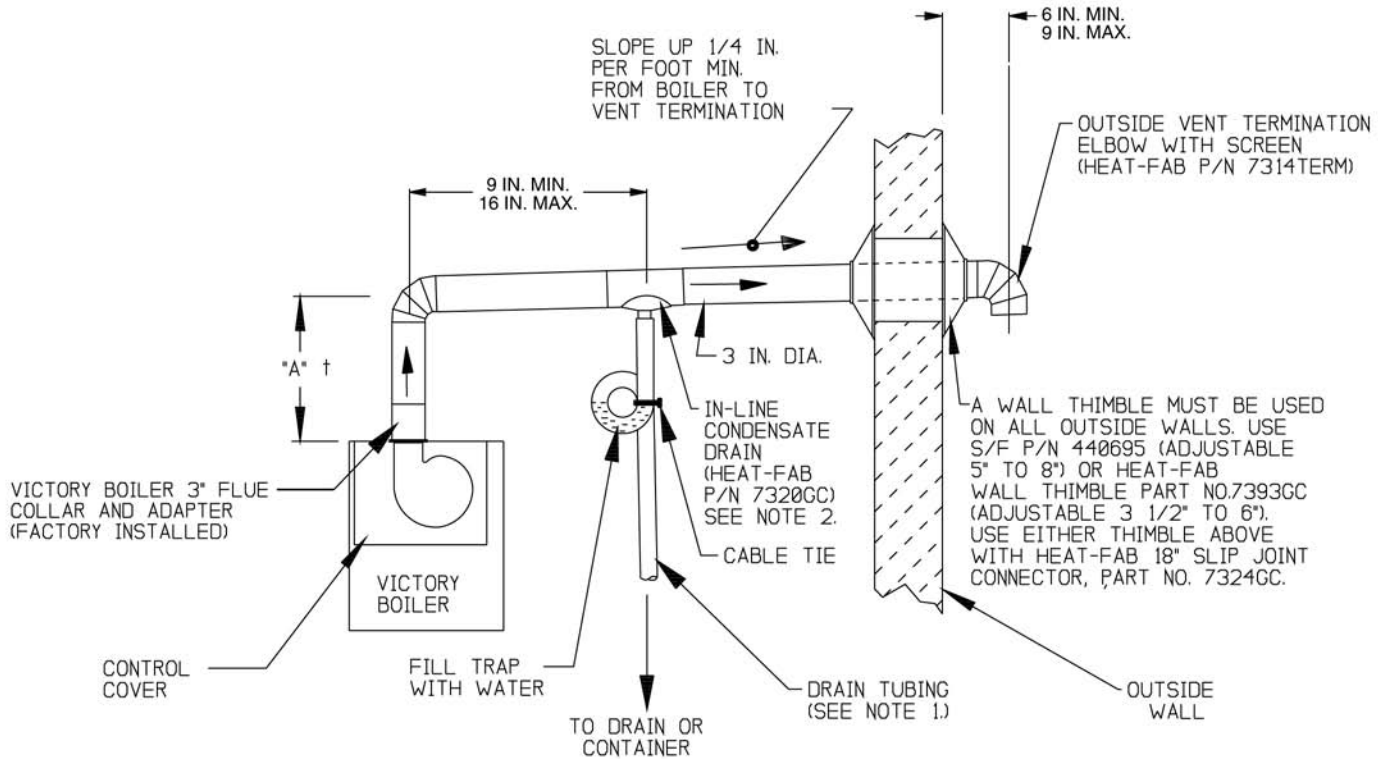
**Figure 6b. Venting with "B" vent or metal-lined chimney for V-90, V-120, V-150 and V-180 only**

**Minimum vent connectors diameter is 5 inches. It may have to be upsized to 6 or 7 inches (see Table 2).** Single or multiple appliance venting into Type "B" double wall metal vent with single or Type "B" metal connectors, must be installed in accordance with National Fuel Gas Code ANSI Z223.1-latest edition, part 7 and 11. **DO NOT** use galvanized risers and connectors in cool boiler rooms.

**ALL ITEMS SHOWN BELOW ARE REQUIRED EXCEPT WHERE OTHERWISE INDICATED. All vent connector joints must be liquid tight.**



**Figure 7. Horizontal Venting (3 IN.): All Victory Models**  
**All items shown below are REQUIRED. All vent joints must be LIQUID and PRESSURE TIGHT.**  
 Use only 3" dia. Saf-T vent (#AL 29-4C\* stainless steel) venting materials by Heat-Fab Inc.  
 (See both horizontal and vertical venting in this booklet for restrictions).



BOILER MODEL	"A" DIM. (INCHES)
V-33 V-60	12 IN. MAX.
V-90 V-120 V-150 V-180	† 24 IN. MAX.

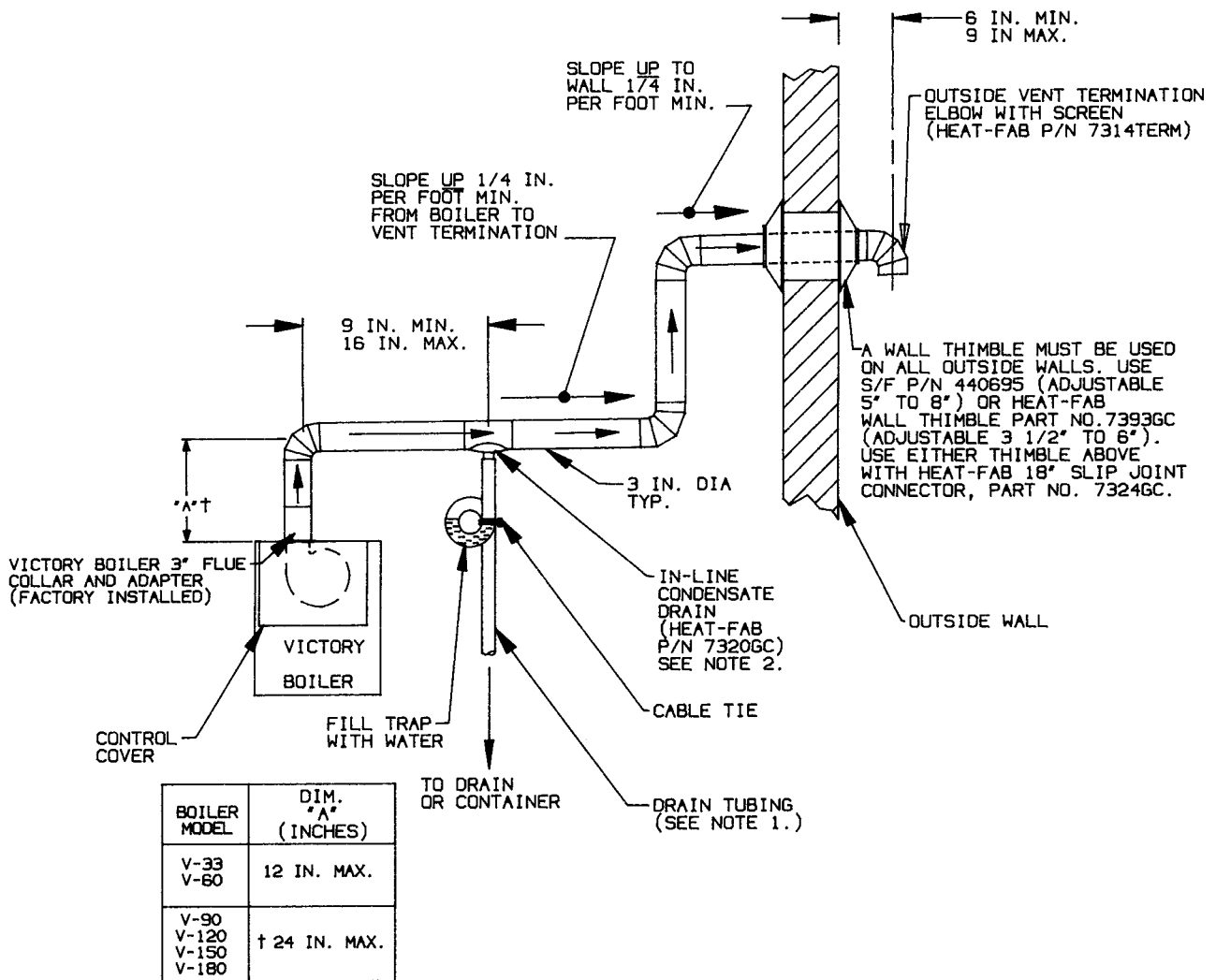
†IN COLD BOILER ROOMS USE "A" 12 INMAX.

NOTES:

1. DRAIN TUBING: 1/2" I.D. P V C CLEAR PLASTIC TUBING. INSTALL CABLE TIE.
  2. ALTERNATE CONDENSATE DRAIN ASSY. TEE AND DRAIN TEE COVER (HEAT-FAB P/N 7317GCC AND 7316GC) MAY BE USED
- \*: AL 29-4C IS A REGISTERED TRADEMARK OF ALLEGHENY LUDLUM CORP.



**Figure 8. Horizontal Venting (3 IN.): All Victory Models**  
**All items shown below are REQUIRED. All vent joints must be LIQUID and PRESSURE TIGHT.**  
 Use only 3" dia. Saf-T vent (#AL 29-4C\* stainless steel) venting materials by Heat-Fab Inc.  
 (See both horizontal and vertical venting in this booklet for restrictions).

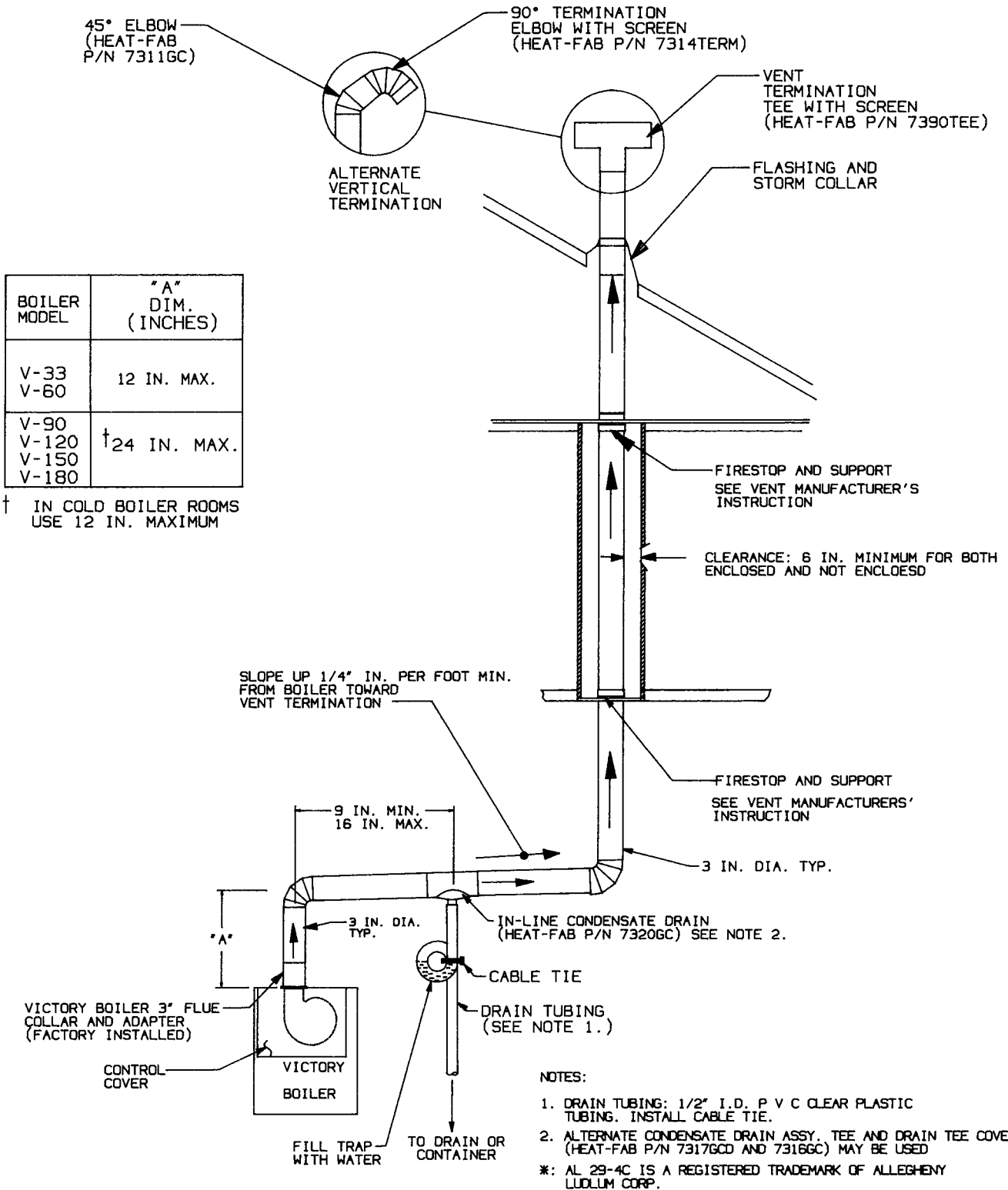


† IN COLD BOILER ROOMS USE "A" 12 IN. MAX.

NOTES:

1. DRAIN TUBING: 1/2" I.D. P V C CLEAR PLASTIC TUBING. INSTALL CABLE TIE.
  2. ALTERNATE CONDENSATE DRAIN ASSY. TEE AND DRAIN TEE COVER (HEAT-FAB P/N 7317GCD AND 7316GC) MAY BE USED.
- \*: AL 29-4C IS A REGISTERED TRADEMARK OF ALLEGHENY LUDLUM CORP.

**Figure 9. Vertical Venting (3 IN.): All Victory Models**  
**All items shown below are REQUIRED. All vent joints must be LIQUID and PRESSURE TIGHT.**  
 Use only 3" dia. Saf-T vent (#AL 29-4C\* stainless steel) venting materials by Heat-Fab Inc.  
 (See both horizontal and vertical venting in this booklet for restrictions).



Length of Pipe in Feet	Gas Flow In Piping -- cu. ft. per hr.				
	Iron Pipe Size (Ips)—inches				
	1/2	3/4	1	1-1/4	1-1/2
10	132	278	520	1050	1600
20	92	190	350	730	1100
30	73	152	285	590	890
40	63	130	245	500	760
50	56	115	215	440	670
60	50	105	195	400	610
70	46	96	180	370	560
80	43	90	170	350	530
90	40	84	160	320	490
100	38	79	150	305	460

At pressure drop of 0.3 in. water, specific gravity = 0.60.

at test pressures equal to or less than 1/2 PSIG.

- D. All gas piping used should be inspected thoroughly for cleanliness before makeup. A sediment trap must be provided, as illustrated on page 2.
- E. The minimum and maximum gas supply pressure (at the inlet of gas valve) are shown on the boiler rating plate for the type of gas used. Gas supply pressure should never be less than minimum or more than maximum pressure when the boiler or any other appliance is turned on or off.

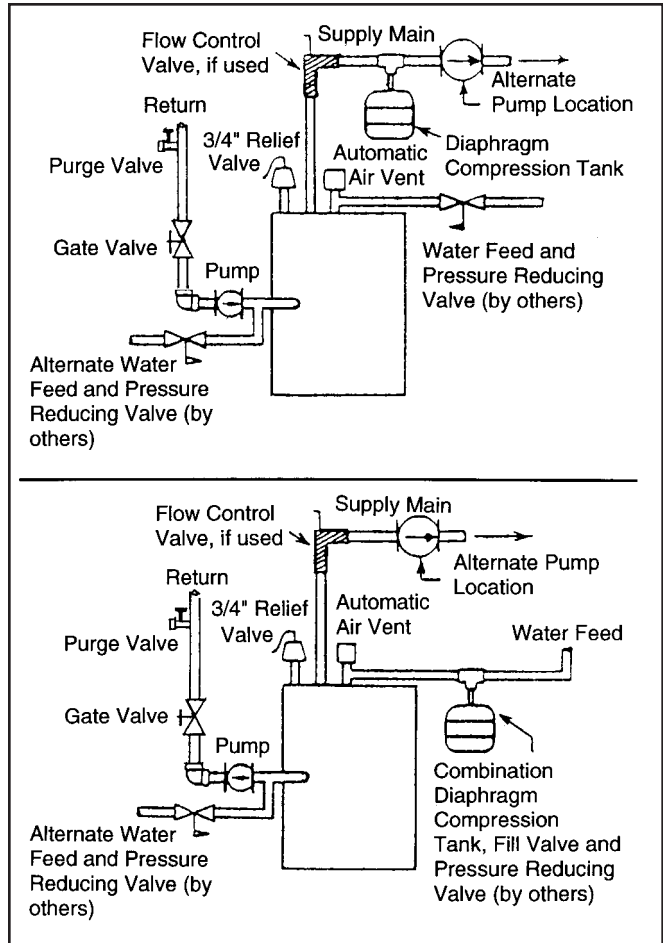
**ELECTRICAL CONTROLS AND WIRING**

- A. The electrical power to the boiler must be on a separately fused and live circuit.
- B. If an external electrical source is utilized, the boiler, when installed, must be electrically grounded in accordance with the requirements of the authority having jurisdiction or, in the absence of such requirements, with the National Electrical Code, ANSI/NFPA No. 70-latest edition.
- C. Basic control wiring diagrams are given on page 17 and 18. Other control systems may be factory supplied: see User's Information Manual and instructions packed with control system supplied.
- D. After placing the boiler in operation, the safety shutoff device must be tested. See page 14 safety check.

**BOILER ROOM AIR SUPPLY AND VENTILATION**

An ample supply of air is required to obtain combustion and ventilation. ALL AIR COMES FROM OUTSIDE, directly through wall openings to the boiler or through unsealed openings around windows, doors, etc. in the whole building. When buildings are insulated, caulked and weather-stripped, now or later on, direct openings to outside may be required and should be provided. If the boiler is not near an outside wall, air may be ducted to it from outside wall openings. Provisions for combustion and ventilation air must be made in accordance with section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1-latest edition, or applicable provisions of the local building codes. The following recommendation applies to buildings of energy-saving construction, fully caulked and weather stripped: Provide one GRILLED opening near the floor and one near the ceiling on an outside wall near the boiler (or duct from such openings to the boiler), EACH opening to be a minimum of one square inch per 2000 Btuh input to ALL APPLIANCES in the area. For a total appliance input of 200,000 Btuh, each opening will be 100 square inches. A grilled

Figure 10. Air Eliminating System



opening 10"X10" has 100 square inches of area. If fly screen must be used over openings, double the area and inspect and clean the screen frequently.

Openings must never be reduced or closed. If doors or windows are used for air supply, they must be locked open. Protect against closure of openings by snow and debris. Inspect frequently.

No mechanical draft exhaust or supply fans are to be used in or near the boiler area.

The flow of combustion and ventilating air to the boiler must not be obstructed.

**WATER PIPING**

**I. CIRCULATING SYSTEMS**

- A. Packaged water boilers are equipped with a water circulating pump, mounted to return the water into the boiler. For some installations, the pump should be on the supply main. See PUMP LOCATION, on page 12.

**II. AIR CONTROL SYSTEM**

- A. DIAPHRAGM-TYPE COMPRESSION TANKS are used to control system pressure in an AIR ELIMINATING SYSTEM; an automatic air vent is used to REMOVE air from the system water. See illustration. If system pressure needs further control, add an additional tank or install a larger capacity tank. Locate the tank near the boiler, as illustrated. An automatic air vent should be installed in the top of the boiler. See illustration.

- B. PUMP LOCATION-Locating low-head pump(s) on return to boiler is acceptable for smaller boiler sizes in residences of one or two stories. The alternate pump location shown in illustration on page 11 is required in large, multi-story building installations, especially when high-head pumps are used. The compression tank must be at the boiler or between boiler and supply main pump(s).
- C. On a hot water boiler installed above radiation level, the boiler must be provided with a low water cutoff device at the time of installation by the installer.

## OPERATING INSTRUCTIONS, BASIC

### I. FILLING AND VENTING WATER SYSTEMS

- Fill the system with water. Vent or purge of air.
- Fire the boiler as soon as possible (see following warning and instructions) and bring water temperature to at least 180 degrees, while circulating water in the system.
- Vent air and add water as needed to achieve operating pressure on boiler gauge. Pressure must be between approximately 12 psi (cold water) and 25 psi at water temperature setting of high limit control, for boilers equipped with 30 psi relief valves. Boilers rated for a higher pressure and equipped with a matching relief valve may operate at a higher pressure, but no higher than 5 psi below the relief valve opening pressure.
- Check for and repair any leaks before placing system in service.

BEFORE FIRING BOILER, make these checks:

- System is full of water. Air is vented or purged.
- Relief valve is installed in accordance with ASME Boiler and Pressure Vessel Code, Section IV. Valve opening is not closed or reduced in size.
- Venting is installed according to instructions under "FLUE GAS VENTING REQUIREMENTS".
- All wiring is completed, following applicable wiring diagrams.
- Using soap solution, check for gas leaks in all gas piping from meter to boiler pilot and manifold. DO NOT use open flame.

### II. INITIAL START

Safe lighting and other performance criteria were met when testing various gas manifold and control assemblies used on the Victory Series Boilers under the ANSI Z21.13- 1987 Standard.

#### Instructions

Follow the lighting instructions in this manual that apply to the particular ignition system equipped on this boiler. (Also, see figures on page 2 for location of gas manifold, gas valve and control assembly.) These instructions are also attached to the boiler.

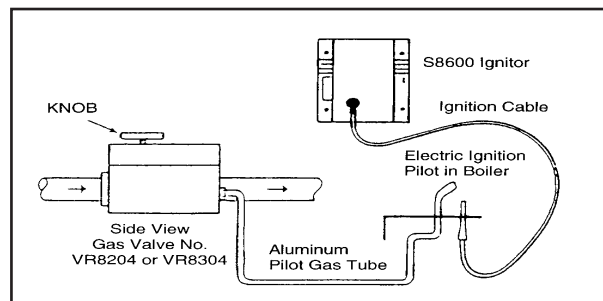
## SAFETY INFORMATION

For Your Safety Read Before Operating



**WARNING:** If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- This appliance is equipped with an ignition device which automatically lights the pilot. DO NOT try to light the pilot by hand.
- BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.
  - WHAT TO DO IF YOU SMELL GAS
    - DO NOT try to light any appliance.
    - DO NOT touch any electric switch; DO NOT use any phone in your building.
    - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
    - If you cannot reach your gas supplier, call the fire department.
- Use only your hand to push in or turn the gas control knob. NEVER use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- DO NOT use this appliance if any part has been underwater. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been underwater.

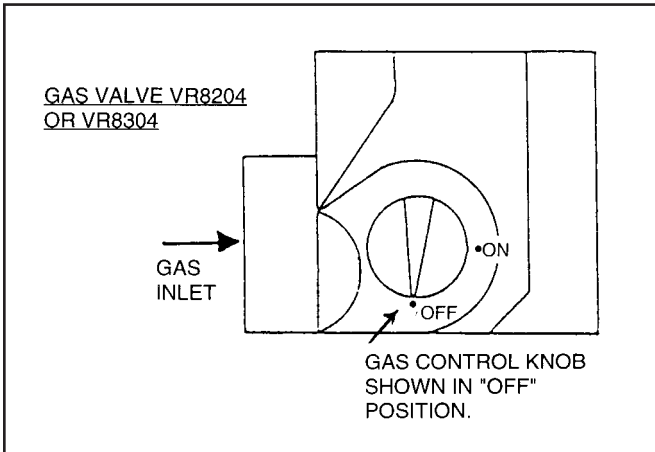
Figure 11.



## OPERATING INSTRUCTIONS FOR VR8204 OR VR8304 VALVE

- STOP! Read the safety information above.
- Set the thermostat to lowest setting.
- Turn off all electric power to the appliance.
- This appliance is equipped with an ignition device which automatically lights the pilot. DO NOT try to light the pilot by hand.
- Turn gas control knob clockwise  to "OFF". DO NOT force.
- Wait five (5) minutes (longer for propane) to clear out any gas, then smell for gas, including near the floor. If you then smell gas, STOP! Follow "B" in the safety information above. If you don't smell gas, go to next step.
- Turn gas control knob counterclockwise  to "ON".

**Figure 12. IID System with Honeywell VR8204 or VR8304 Gas Valve**



8. Turn on all electric power to the appliance.
9. Set thermostat to desired setting.
10. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

**To Turn Off Gas to Appliance**

1. Set thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Turn gas control knob clockwise to "OFF". DO NOT force.

**III. BURNER ADJUSTMENT**

**A. Adjust gas input rate:**

1. Consult gas supplier for higher heating value of gas (Btu/cu.ft.).
2. Set thermostat high enough so that boiler will remain on while checking rate.
3. Measure manifold pressure at 1/8" tapping. Correct manifold pressure for gas used is printed on boiler rating plate. NOTE: Gas pressure may be adjusted by turning pressure regulator screw on combination gas valve (turn clockwise to increase pressure, counterclockwise to decrease pressure).
  - a. Input for PROPANE is approximately at rating shown on rating plate when manifold pressure is 9-1/2" water column.
  - b. Input for NATURAL GAS is approximately at rating when manifold pressure is 3-1/2" water column, but should be checked on the gas meter:  
 $\text{Btuh Input} = \text{Btu/cu. ft.} \times \text{cu. ft. metered in 3 minutes} \times 20$

**Example 1:**

For 1000 Btu/cu.ft. gas, this becomes:  
 $\text{Btuh Input} = \text{cu. ft. metered in 3 minutes} \times 1,000 \text{ Btu/cu.ft.} \times 20$

**Example 2:**

For 1050 Btu/cu.ft. gas, this becomes:  
 $\text{Btuh Input} = \text{cu. ft. metered in 3 minutes} \times 1050 \text{ Btu/cu.ft.} \times 20$

4. The higher\* heating value of gas varies substantially for different localities. Consult with Slant/Fin's Technical Service Dept. for re-orificing procedures if any of the following apply:

- a. Boiler (burner) is overfiring. CAUTION! National Fuel Gas Code (ANSI Z223.1-latest edition) does NOT permit firing at a higher input rate than the input rate indicated on the boiler rating plate in order to avoid hazardous conditions such as explosion or carbon monoxide poisoning.
  - b. Poor higher\* heating value of gas is causing the actual input to be substantially lower than the rating plate indication.
- \* "Higher heating" value of gas is commonly known as "heating value".

The gas metered in 3 minutes to obtain rated input for each boiler model, using 1000 Btu/cu.ft. gas, is tabulated in gas rate table.

Boiler rated input in cu. ft./hr. of 1000 Btu/cu. ft. Natural Gas	Cubic Feet Gas Consumption 1000 Btu/cu. ft. gas, in 3 minutes, at rated input
33	1.65
60	3.00
90	4.50
120	6.00
150	7.50
180	9.00

**B. Main Burners**

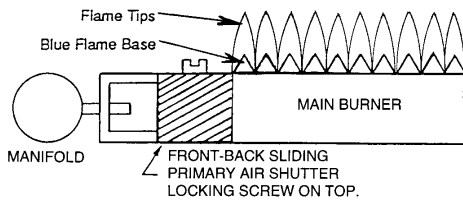
1. Fire the boiler continuously for at least 15 minutes, to reach burner operating temperature.
  2. Observe the flames, all burners. The base of all flame jets should be blue. The tips should be blue shading to orange. NOTE: Dust, disturbed by any movement, will cause bright orange flames. Wait for dust to settle.
  3. For one burner, close the air shutter until some of its flame jet tips turn yellow-white, indicating insufficient primary air. Then open shutter until whitish tips disappear completely. Set all burner shutters to the same opening. Observe to make sure that no yellow-white tips appear over any portion of the flame. Small yellow tips at the pilot location are permitted.
- NOTE: This adjustment method gives MINIMUM primary air setting for safe combustion. DO NOT attempt to make this adjustment unless burners are at operating temperature. Adjustment should be made with burner access panel in final operating position. Use of a mirror may be helpful to observe flames. Note that burner ports are on top of main burner tube.

**C. Main Burner Ignition Checkout and Pilot Adjustment.**

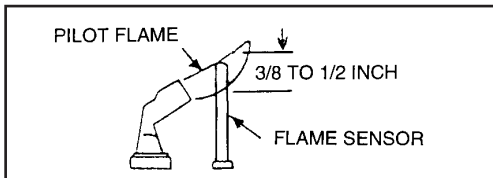
1. The pilot flame must not smother or snuff out when tested as follows:
  - a. Main burner ignition from cold start-repeat.
  - b. Continued operation of main burner.
  - c. Main burner ignition with appliance at maximum operating temperature after prolonged operation.

NOTE: Observe operation of the pilot burner with appliance doors in the final operating position. Use of a mirror may be helpful.





2. Safety Shutdown Checkout
  - a. For proper operation the pilot should engulf the thermocouple, powerpile generator or flame sensor as shown below.



- b. To adjust pilot, turn pilot flow adjustment screw on valve clockwise or counterclockwise to give a steady flame enveloping 3/8 to 1/2 inch of the tip of the thermocouple, generator or flame sensor. Note that turning the pilot adjust screw clockwise will decrease the pilot flame.
- c. Check safety shutdown of gas valve by following procedure outlined "CARE" and "MAINTENANCE" section, item IV-3 in this booklet.

## CARE AND MAINTENANCE

**WARNING: THE FLOW OF COMBUSTION AND VENTILATING AIR TO THE BOILER SHOULD NOT BE OBSTRUCTED.** This section must be brought to the attention of the owner by the installer so that the owner can make the necessary arrangements with a qualified service agency for the periodic care and maintenance of this boiler. The installer must inform the owner that the gas supplier can recommend a number of qualified service agencies. The installer must also inform the owner that the lack of proper care and maintenance of this boiler and any fuel burning equipment may result in a hazardous condition.

### 1. GENERAL MAINTENANCE (Refer also to Owner's Information Manual)

- These operations are recommended to be performed at regular intervals:
- A. **BOILER HEATING SURFACES:** clean off all coatings found.
  - B. **BOILER CONTROLS:** check contacts, settings, correct functioning.
  - C. **PIPING:** check piping and accessories for leaks.
  - D. **CHIMNEY VENTING SYSTEM:** check for obstructions and leaks. If the boiler is vented horizontally through the wall, the outside termination elbow and screen should be checked for any debris blocking the opening and cleaned as required.
  - E. **BOILER ROOM AIR SUPPLY:** check air vents for continued POSITIVE supply of air as required. Air needs are greatest in cold weather. Air vents must be open and free of obstruction.
  - F. **WATER SYSTEM:** check
    1. System to be full of water, and pressure to remain stable at correct setting on gauge.
    2. Air-control system: noise and air binding in radiation

should not occur.

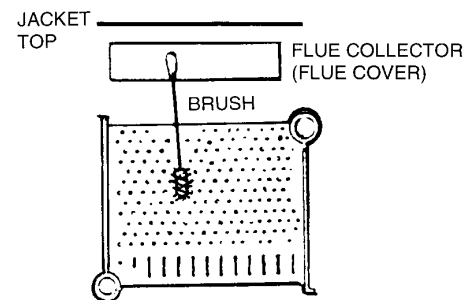
3. Water lines: slightest leaks should be corrected.
4. Low water cutoff, for operation (see instructions furnished with unit).

### II. WATER LEVEL CHECK DURING HEATING SEASON:

- A. Check water pressure regularly and add water slowly to system when needed. If much water is added, venting may be necessary.
- B. Regular loss of water from water boiler system may indicate either a system leak, or a faulty air control system, or a faulty automatic fill valve.

### III. ANNUAL INSPECTION AND CLEANING:

- A. It is important that this boiler be inspected by a competent serviceworker to help insure safe and reliable operation.
- B. Check for gas leaks from valve and gas piping to burners and pilot. If leaks are found, repair or replace as required.
- C. This inspection should include:
  1. Controls check. See SAFETY CHECK, IV.
  2. Recheck of input gas rate to burners. See "Initial Start" paragraph in "Operating Instructions" section.
  3. Re-adjusting for best flame characteristics of main flame and pilot(s). See "Initial Start" paragraph in "Operating Instructions" section and see "Burner Adjustment" section.
  4. Burner and boiler flue passage cleanliness: BURNER AND FLUE CLEANING (see sketch). It is suggested that paper be placed on burners to collect any foreign material in cleaning flues.
  5. Remove jacket top and flue cover. Remove inducer assembly.
  6. Use wire brush to clean flueways.
  7. Replace flue cover and re-seal with furnace cement. Replace jacket top. Remove and dispose of paper and accumulated material. Replace inducer assembly. To prolong life of motor, lubricate with 6 drops of Anderol 465 annually.



8. If burner surfaces are not clean, or if uneven flame indicates plugged burner ports, remove and clean burners.

#### NOTE—TO REMOVE BURNERS:

1. Disconnect pilot at pilot mount, or disconnect pilot gas line at gas valve, before removing burners next to pilot.
2. Lift burner and remove burner from orifice.
3. Clean and replace burners\* and pilot. Adjust

burners as described on page 13.

\*To clean burners run a clean flue brush up the tube until all foreign matter is removed.

IV. SAFETY CHECK FOR CONTROL SYSTEM

1. Remove Control Cover

To remove control cover, remove the two sheet metal screws in the top of the top cover. (See figure 13.) Tilt complete control cover away from boiler and lift up until it clears the bottom angle bracket. To replace the cover, reverse procedure. Be sure that the tab on the bottom of the cover body enters the slot in the bottom angle bracket. CAUTION: The boiler should not be operated with cover off except during certain control checkouts.

2. High Limit Control Test

Set thermostat high enough for boiler water temperature to reach high limit control setting. When this temperature is reached, the high limit switch should open and the main gas valve should close automatically. If the high limit does not operate to close the main gas valve, the valve, the high limit or the wiring is faulty. Repair or replace immediately.

3. Gas Valve Safety Shutdown Test

For boilers equipped with Honeywell S8600 intermittent pilot systems, with main burners firing, disconnect the ignition cable from the S8600 IGNITOR BOX. The gas valve should shut off the main burners.

If the gas valve fails to shut off the main burners when the test is performed, replace the gas valve.

4. Air Flow Pressure Switch Check

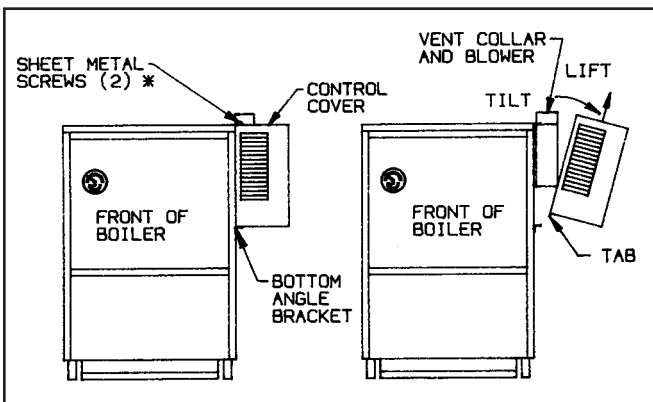
With the main burners firing, remove hose from pressure switch, the one toward front of boiler, see figure 14. (Model V-180 has a single sensing hose.) Gas valve should shut off the main burners.

If the main burners do not shut down, shut off the power to the boiler and check for continuity across the pressure switch contacts. If the switch is made when the inducer is not running, replace the pressure switch with one with the exact model number as the existing switch.

If the switch is open and burners do not shut off, replace the ignition control or gas valve.

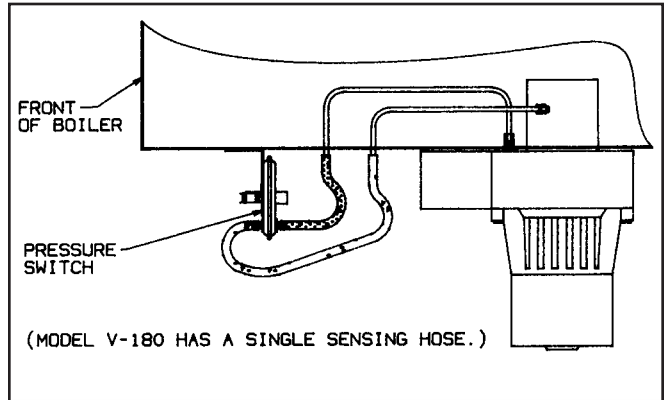
5. Check for gas leaks from valve and gas piping to burners and pilot. If leaks are found, repair or replace as required.

Figure 13.



\* For service remove ONLY these two screws. DO NOT remove any other screws.

Figure 14. Top View of Boiler



V. 1. Providing Protection from Freezing

Anti-freeze is sometimes used in hydronic heating systems to protect against freeze-up in the event of power failure or control shutdown when the building is unoccupied. It should be recognized that unless the building is kept above freezing temperature by some means, the plumbing system is not protected.

Two types of anti-freeze may be used: ETHYLENE GLYCOL, used in automobiles, has desirable properties, but is toxic. Its use may be prohibited when system water/glycol solution is in contact with a potable water vessel (as with a tankless heater). PROPYLENE GLYCOL is used in the quick-freeze food industry; it is practically non-toxic. Its use may be permitted when tankless heaters are used. When anti-freeze must be used, inhibited propylene glycol is recommended. Useful information on the characteristics, mixing proportions, etc. of glycol in heating systems is given in Technical Topics No. 2A, available from the Hydronics Institute, 34 Russo Place, Berkeley Heights, NJ 07922. Consult glycol manufacturers for sources of propylene glycol.

2. Water Treatment

A good water treatment program will not only extend the useful life of this boiler but it will also save much of the time and expense of repairs made necessary by preventable occurrences.

A reputable water treatment company should be consulted to evaluate and determine the best overall treatment program for your boiler equipment.

VI. KEEP THE BOILER AREA CLEAR AND FREE FROM COMBUSTIBLE MATERIALS, GASOLINE, AND OTHER FLAMMABLE VAPORS AND LIQUIDS.

BOILER WATER CONTENT		
Model	Pounds	Gallons
V-33	17.50	2.1
V-60	24.75	3.0
V-90	32.00	3.8
V-120	39.25	4.7
V-150	46.50	5.6

**APPENDIX A****Removal Of Existing Boiler From Common Vent System**

"At the time of removal of an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation."

- (a) Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
- (b) Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any appliance not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. DO NOT operate a summer exhaust fan. Close fireplace dampers.
- (c) Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.
- (d) Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar or pipe.
- (e) After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas-burning appliance to their previous conditions of use.
- (f) Any improper operation of the common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1-latest edition. When resizing any portion of the common venting system, the common venting system should be resized to approach the minimum size as determined using the appropriate tables in part 11 in the National Fuel Gas Code, ANSI Z223.1-latest edition.

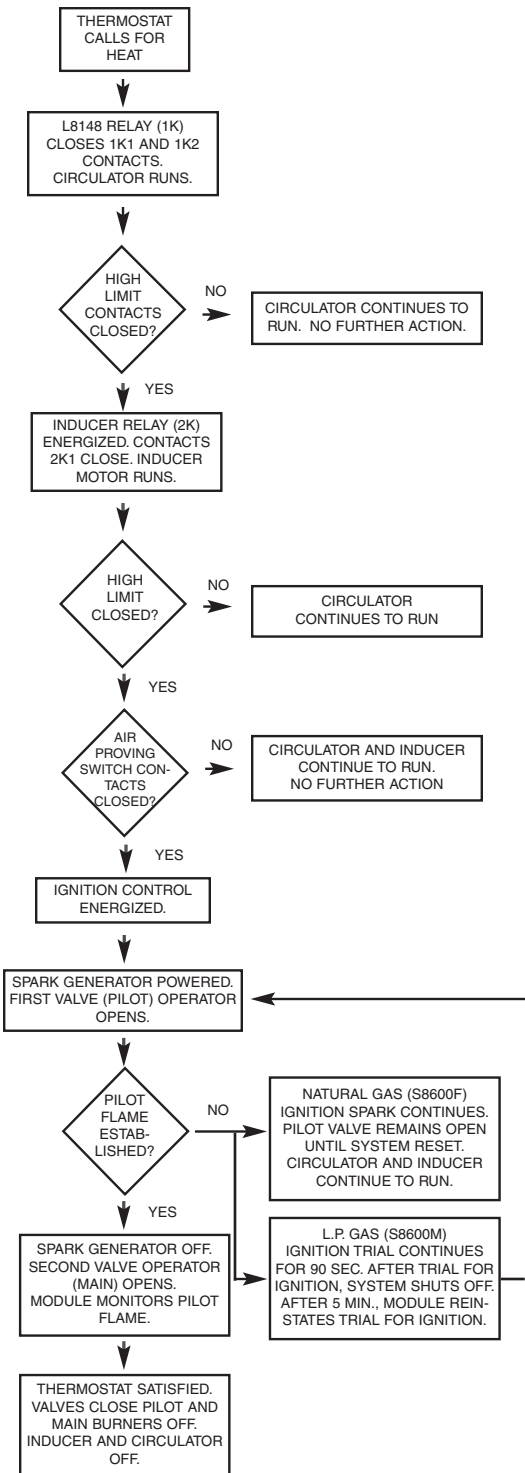
**APPENDIX B****Vent System Location and Condensation Drain Requirements**

1. The venting system shall terminate at least 3 feet above any forced air inlet located within 10 feet.
2. The venting system shall terminate at least 4 feet below, 4 feet horizontally from, or 1 foot above any door, window or gravity air inlet into any building. The bottom of the vent terminal shall be at least 12 inches above grade or the normal snow level, whichever is greater.
3. Through the wall vents for Category II and IV appliances shall not terminate over public walkways or over areas where condensate or vapor could create a nuisance or hazard or could be detrimental to the operation of regulators, relief valves or other equipment. Minimum clearance of 4' horizontally from, and in no case above or below, unless a 4' horizontal distance is maintained, from electric meters, gas meters, regulators and relief equipment. Where local experience indicates that condensate may be a problem with Category I and III appliances, this provision shall also apply.
4. Provision shall be made to collect and dispose of condensate from venting systems serving Category I, II, III and IV appliances.

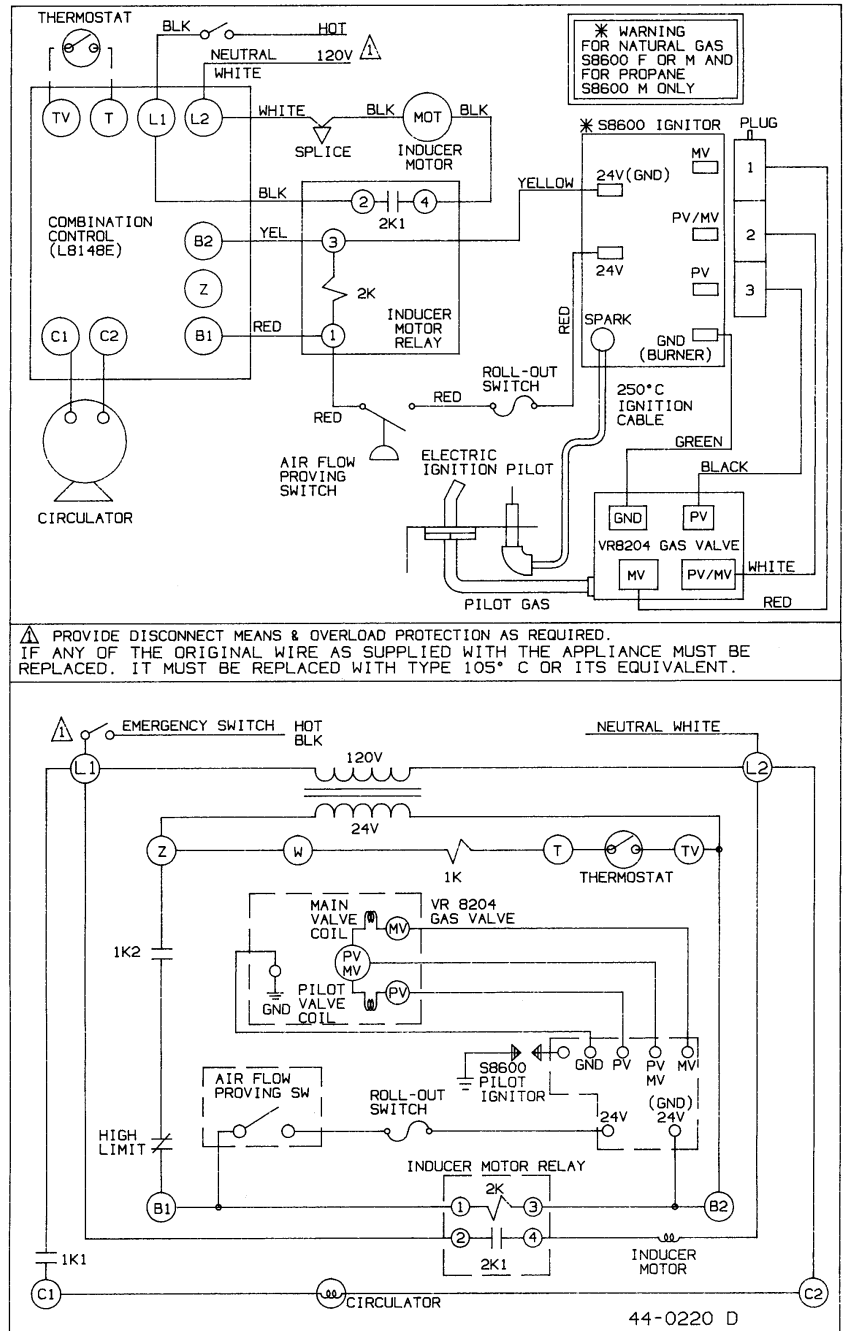
**Caution**

Flue gases exiting from the vent terminal will condense. Building materials in the area of the vent terminal should be protected from discoloration and degradation.

Sequence of Operations

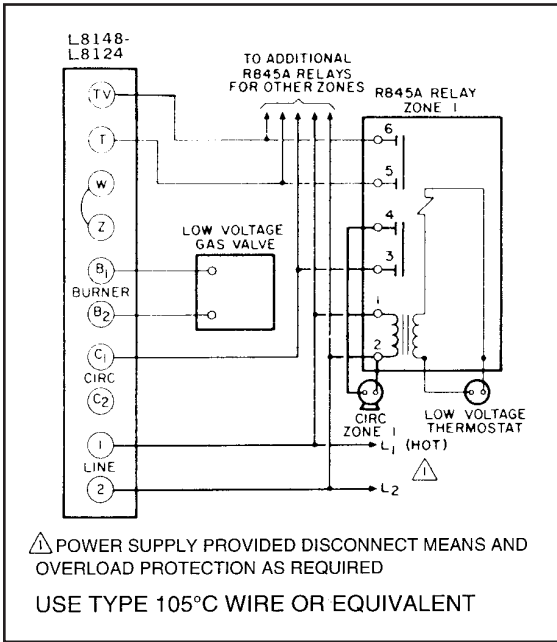


Wiring Diagrams



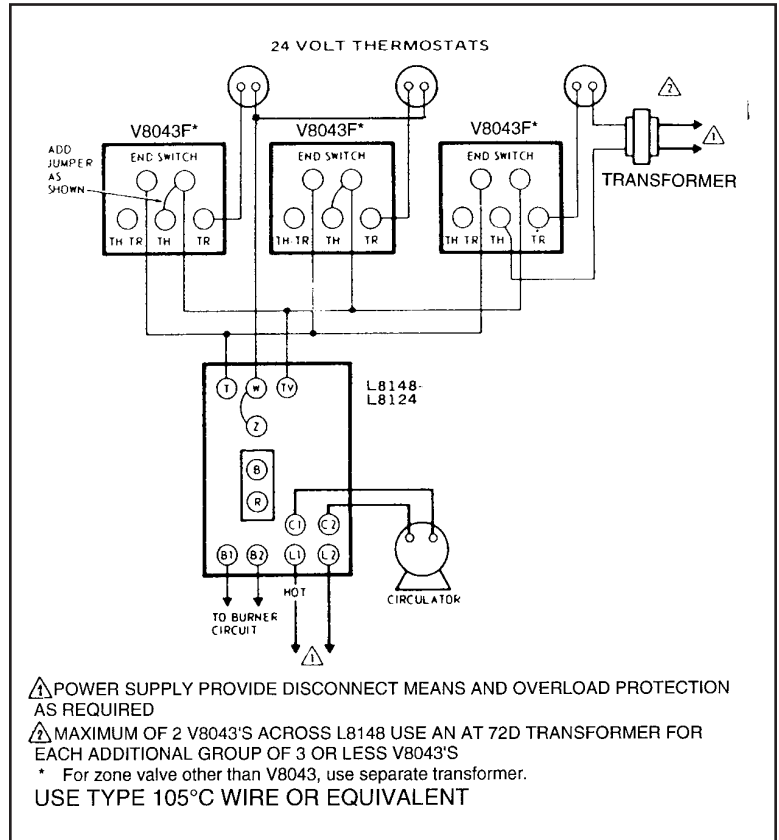
CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. "Verify proper operation after servicing."

# PUMP OR VALVE ZONING OF WATER BOILERS COMBINATION CONTROLS WITH (T) (TV) (Z) TERMINALS\*

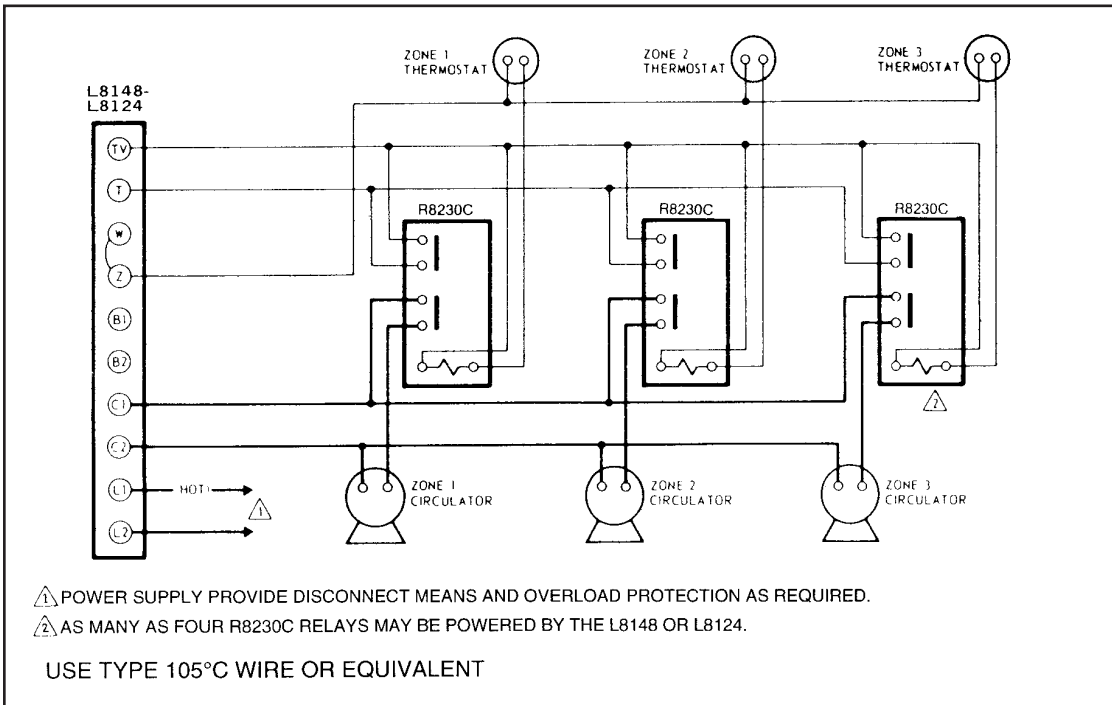


Pump Zoning system using R845 Relay.  
One R-845A needed for each circulator.

NOTE: Pumps are powered from C1. Total pump load must not exceed 7.4 amp rating of combination control pump switch.



Zone valve zoning system using Honeywell V8043F zone valves.



Pump zoning system using R8230C Relays.

\*For zoning diagrams, combination controls without (T) (TV) (Z) terminals and non-combination control systems, consult Slant/Fin Zoning Technical Bulletin.

NOTE: Pumps are powered from (C1). Total pump load must not exceed 7.4 amp rating of combination control pump switch.



**BURNERS FAIL TO OPERATE****CAUSE**

1. Safety pilot out, or flame too low.
2. Gas supply valve shut off.
3. Electric switch open.
4. Blown or defective line fuse.
5. Operating or limit control contacts open or dirty.
6. Defective gas valve or pressure regulator; or plugged bleed line.
7. Defective low voltage transformer of aquastat relay.
8. Obstruction at main burner orifice.
9. Break in wiring or loose contact at control terminals.
10. Improper wiring.
11. Improper controls.
12. Defective air flow pressure switch.
13. Rollout switch open.

**REMEDY**

1. Check, clean, re-light. See instructions.
2. Open gas valve(s).
3. Close switch.
4. Replace fuse.
5. Check control. Clean contacts or replace control.
6. Repair or replace.
7. Replace aquastat.
8. Check, clean and reinstall.
9. Check with test-light and correct.
10. Check and correct in accordance with wiring diagrams included with appliance instructions.
11. Install proper controls.
12. Check and replace if necessary.
13. Replace rollout switch (inspect flue passages prior to replacement).

**BURNERS WILL NOT SHUT OFF****CAUSE**

1. Defective operating control, gas valve, or high limit control.
2. Improper wiring or short circuit.

**REMEDY**

1. Check, repair or replace.
2. Check wiring and controls.

**FLASH BACK - BURNING AT ORIFICES****CAUSE**

1. Manifold gas pressure too low.
2. Improper primary air adjustment.
3. Gas regulator bleed too slow.
4. Burrs on orifice.
5. Improperly drilled orifice plugs.
6. Leaking automatic gas valve.
7. Adverse draft condition in boiler room.
8. Low main gas pressure.
9. Safety pilot improperly installed.

**REMEDY**

1. Adjust to proper manifold pressure.
2. Adjust air to produce soft, clean flame.
3. Adjust bleed opening.
4. Remove burrs.
5. Install orifice plugs with proper drilling.
6. Repair or replace.
7. Check air supply and venting system.
8. Contact utility.
9. Correct to manufacturer's recommendations.

**DELAYED IGNITION****CAUSE**

1. Pilot flame too low.
2. Pilot burner ports or pilot orifice clogged.
3. Burners or orifices out of alignment.
4. Excessive primary air.
5. Excessive burner input.
6. Adverse draft condition in boiler room.

**REMEDY**

1. Increase gas supply to pilot.
2. Clean ports or orifices.
3. Realign burners or manifold.
4. Adjust primary air shutters.
5. Check and reduce to input shown on rating plate.
6. Check air supply and venting system.

**FUMES AND GAS ODORS****CAUSE**

1. Leaks in gas piping or accessories.
2. Gas leaks in service line or meter connections.
3. Blocked chimney.
4. Boiler flueways blocked with soot.
5. Undersized breeching or too many turns in breeching.
6. Adverse draft condition in boiler room.
7. Overfiring.

**REMEDY**

1. Locate leaks and repair.
2. Close service supply valve - shut down appliance and notify utility.
3. Check and repair chimney.
4. Clean flueways and adjust burners as described in the installation instructions.
5. Check manufacturer's recommendations.
6. Check air supply and venting system.
7. Adjust gas input to that shown on boiler rating plate.

**CONDENSATION IN BOILER FLUES OR IN VENT SYSTEM****CAUSE**

1. Underfiring.
2. Boiler water maintained at too low a temperature level.

**REMEDY**

1. Increase firing rate to that shown on rating plate.
2. Set low limit controls to maintain a higher water temperature. If boiler is not equipped with low limit replace with one which has a combination low limit/high limit aquastat.

**BURNER SHORT CYCLES****CAUSE**

1. Thermostat heat anticipator set too high.
2. Excessive pressure drop in venting system.
3. Blockage or restriction in venting system.
4. Faulty air flow proving mechanism.

**REMEDY**

1. Reset anticipator to \*amps.
2. Reroute and/or shorten venting system.
3. Check for blockage or restriction.
4. Consult factory.

\*L8124=.20 amps, L8148=.20 amps, R845A=.40 amps

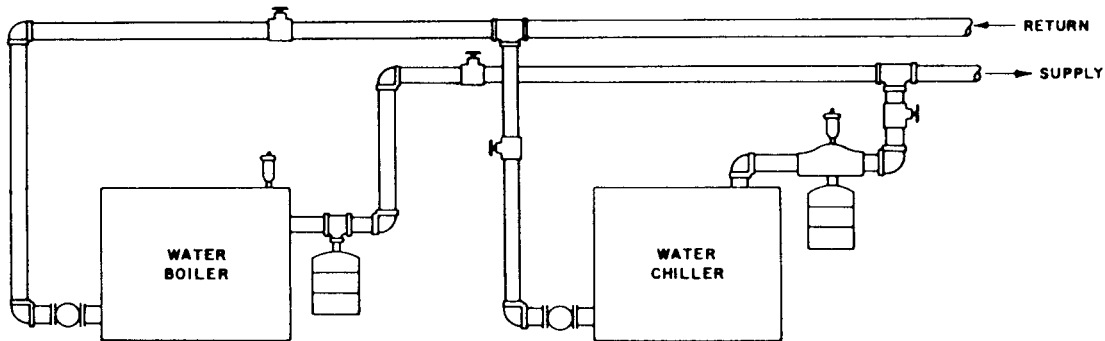
### PIPING A HEATING - COOLING SYSTEM TO A WATER BOILER AND CHILLER

Figure below illustrates a method of piping a heating-cooling system to a water boiler and a chiller. Hand valves (shown) or automatic valves must be installed to prevent circulation of chilled water in the boiler or hot water in the chiller.

The air control system and pressure control system must

operate with chiller only, or the boiler only, being valved to the piping system. Separate control devices on the boiler and chiller may be used, or a single set of air and pressure controls on the common piping may be preferred.

If the boiler is used to supply hot water to heating coils in air handling units, flow control valves or other devices must be installed to prevent gravity circulation of water in the coils during the cooling cycle.



### IF REPLACEMENT PARTS ARE NEEDED

When parts are needed, refer to boiler model and serial number shown on the boiler name/rating plate. Refer to publication number V-10PL Victory Replacement Parts for part numbers. Whenever possible refer to the original order by number and date.

Control identification and replacement should not be attempted by unskilled personnel. Only simple, easily-identified controls

and parts may be obtained locally. All other controls and parts should be identified by and ordered from Slant/Fin. Relief/Safety valves must be ASME rated for the pressure and gross output of the boiler.

Replacement parts are available from:

Slant/Fin Corp.  
100 Forest Drive  
Greenvale, NY 11548

# Slant/Fin®

SLANT/FIN CORPORATION, Greenvale, N.Y. 11548 • Phone: (516) 484-2600

FAX: (516) 484-5921 • Canada: Slant/Fin LTD/LTEE, Mississauga, Ontario

[www.slantfin.com](http://www.slantfin.com)